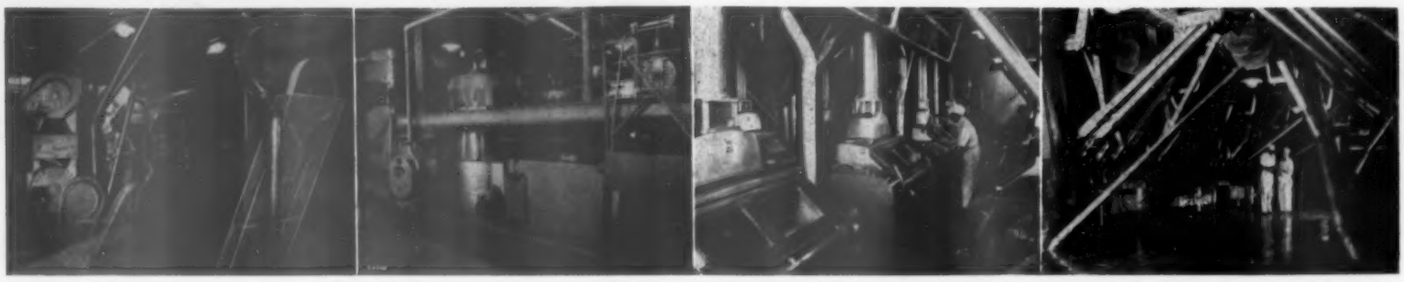
The Northwestern MILLER

MILLING PRODUCTION SECTION



**CANADIAN PNEUMATIC MILL—The first picture shows the disc separators in the cleaning house. An operative is examining some of the screenings removed by the discs. The second picture is of the washers and to the left of the washer bed is the Autodamper, used for adding accurately measured quantities of water to wheat. The roller floor is illustrated in the third picture. In the fourth picture two operatives discuss a point under the spouts from the rollermills to the diffusers in the basement. The pneumatic plant has a nominal capacity of 2,600 sacks, basis 24 hours.**

# Canadian Remodeling Project Provides Pneumatic Plant to Work With Two Standard Installations

The Maple Leaf Milling Company's long term modernization plan has provided a pneumatic plant, with a nominal capacity of 2,600 sacks, basis 24 hours, on hard wheat mixes and this is working alongside two standard mills. The company executives decided that their requirements could be met by constructing one unit which, at least, would give the maximum benefit that modern equipment and a sound technical flow could provide, and at the same time improve the cleaning facilities for the wheat used in the other two mills.

The contract, after considerable examination and inquiry, was placed with the British engineering firm of Henry Simon, Ltd.

The wheat cleaning plant provides comprehensive cleaning arrangements for the three mills. It includes millerators and disc separators, together with different types of scourers and wheat washers and stoners. As the mills handle soft as well as hard wheats, a Simon type F dryer is installed so that wheats with a high natural moisture content can have the benefit of washing and wet stoning and still arrive at the mill at the moisture content required for efficient milling.

The plant also includes a new automatic damping device for adding to hard wheats accurate quantities of moisture by volume. Known as the Autodamper, the device employs a double-acting pump driven by the weight of the wheat itself.

The entire wheat cleaning plant is pneumatic, and there are two separate systems each with three lifts. Each lift has an air guide at the bottom. The air used in the pneumatic wheat cleaning system has three purposes—elevating the wheat, exhausting the machines, and aspirating the wheat in the pneumatic aspirating heads fitted at the top of each lift. The quality of the separations made is clear from the accompanying photograph. The third sample is particularly striking, since it illustrates the machine's value in removing fine dust immediately before the mill. The air for the pneumatic wheat cleaning systems is provided by high speed Sturtevant fans which are very carefully balanced—so carefully balanced, in fact, that a quarter can be stood on edge on them while they are running at 3,500 r.p.m. The pneumatic system also incorporates a special feature developed by the Maple Leaf staff—a type of expansion box after the lifting fan.

After the cleaning and washing runs the wheat is fed to the mill by the third pneumatic lift in each system, and the installation of a pneumatic aspirator immediately before the 1st Break has the beneficial effect of removing fine dust and beeswing freed by the washers. Following the pneumatic aspirator the wheat passes through two Entoleter Scourer-Aspirators and a Duo-Sifter before arriving at the 1st Break—this arrangement is particularly useful when dealing with durum wheats for semolina milling. Provision is also made for the wheat to be heated, prior to the 1st Break, over a very wide range of temperature if so required. The heating system was developed by the Research Association of British and Irish Flour Millers, with the intention of reducing the ash and improving the color of straight flours without loss of extraction or even possibly with a gain in extraction or in patent flour output.

The new wheat mill is an all-purpose unit and contains numerous special runs and features to provide the flexibility required for the milling of hard, soft and durum wheats. It is not surprising therefore that a system has been developed for varying settings so that the full range of products can be obtained with the minimum of delay, after mix changes. It will be appreciated that a unit capable of milling durum wheats as well as soft wheats will have a large stock spread on various purposes.

The rollermills are Simon Type G machines, equipped with the Simon-Hoffman roller bearing which, the company says, has given excellent service since the mill started. The grinding chills are the centrifugally cast type which have a much better performance than statically cast rolls.

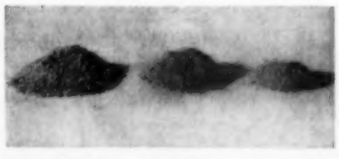
(Continued on page 16a)

## MAPLE LEAF'S MODERNIZATION PROGRAM

**Incorporated in 1910, the Maple Leaf Milling Co. has become Canada's biggest milling company. Operating three flour mill plants—at Port Colborne, West Toronto, and Medicine Hat—the company has sufficient capacity to produce 35,280 sacks of flour a day, and in subsidiary plants attached to the flour mills turns out 1,000 tons of animal feed and a large amount of breakfast cereals, prepared mixed and specialty flours every day.**

**In common with most U.S. and Canadian companies, Maple Leaf has been running a continuous program of modernization in order to keep its plants at the highest possible efficiency. Since World War II the company has installed new handling and warehousing facilities at the manufacturing plants and at the cross-country depots and has carried out an extensive program of research and technical development.**

**Recently the company embarked on a program to improve even further its manufacturing plants, and the first instalment was completed a short time ago. It is a pneumatic mill and wheat cleaning plant at the West Toronto location, where there were already two existing mills. The illustrated article beginning on this page describes the plant.**



**SAMPLES — Pictures are samples from the pneumatic aspirators. Sample 3 is taken from the pneumatic lift to the first break.**

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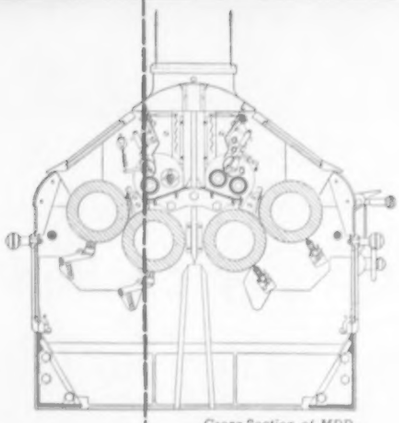
**Millers everywhere recognize the "*Buhler*" as the world's best roller mill for flour milling. Many automatic and advanced features provide outstanding advantages. And you get a beautiful piece of machinery that is a credit to the appearance of any mill.**

**It's a stronger, more streamlined, more compact mill. A Buhler 10" x 40" mill occupies the same space as a conventional 9" x 36"— provides 10% more capacity in the same floor area.**

**The "*Buhler*" is infestation-proof — no spots for insects to breed. High quality rolls insure even grinding, higher extraction, and greater capacity. Simple, uniform, double-roll UNIC feeder is automatic. Feed rolls and grinding rolls are interlocked.**

**Self-aligning, U. S. Standard roller bearings permit higher speeds, greater capacity, and save up to 20% power as against sleeve bearings. No need to replace gears when roll diameter decreases due to special conical gears.**



Cross-Section of MDD

## OPTIONAL FEATURES

**Automatic engaging and disengaging of the grinding rolls by pneumatic means to protect rolls.**

**Choice of chain drive instead of gear drive.**

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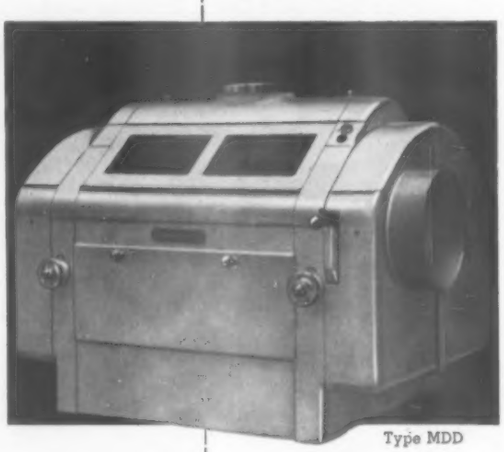
**4-speed regulator for feed rolls.**

**Learn how the roller mill that has contributed so much to the progress of flour milling throughout the world can make more money for you. Write for full details.**



Type MDD

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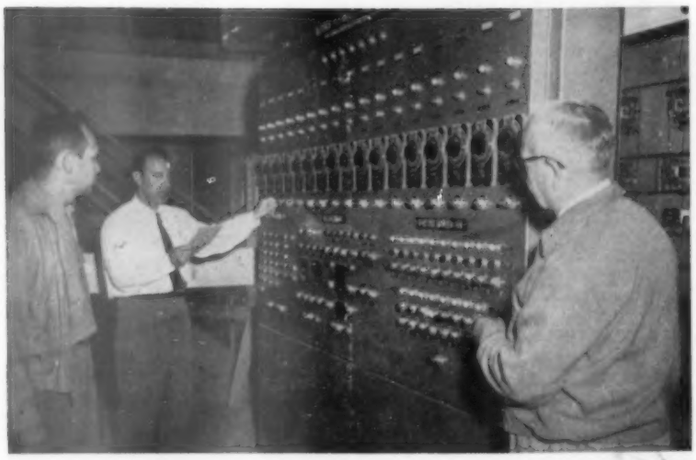


Setting up a batch on the electronic control panel of the automatic mill is Albert Cohen, general manager of the Inter-County Cooperative. Looking on are Joseph Cohen, manager of the organization's feed department, and J. Howard Waldron, manager of the feed and flour division of Sprout, Waldron & Co., Muncy, Pa., which designed the plant in cooperation with Richardson Scale Co.

# AUTOMATION APPLIED

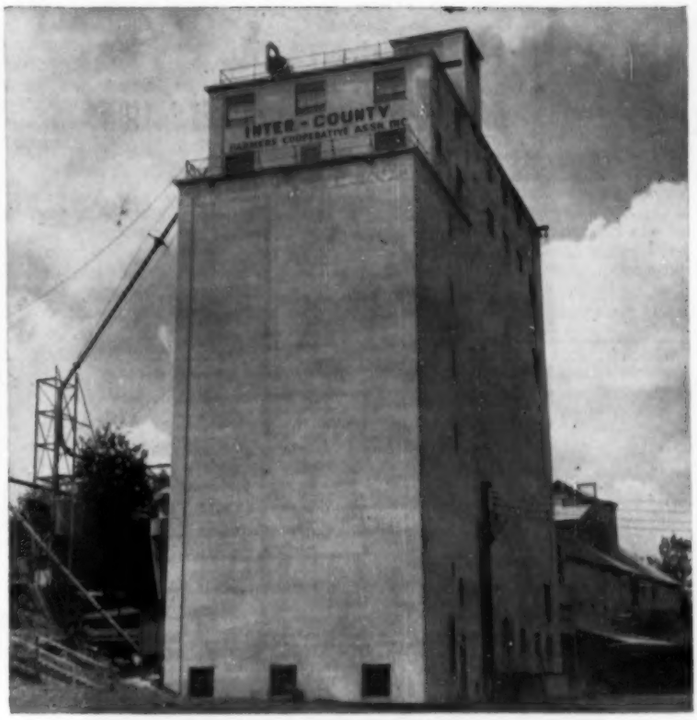
## New Mill Produces Feed Automatically with Limited Amount of Labor

Now operating in up-state New York is a new feed plant which is rated as producing feed with just a fraction of a man-hour per ton.

The mill is that of the Inter-County Farmers Cooperative Assn, Inc. It is located in Woodridge, N.Y., in the center of the Catskill Mountain vacation country.

This modern plant, which will produce 1.5 million bags of feed annually, is believed by the designers and builders to be the "most automatic in operation of any in the U.S., if not in the world."

The Inter-County cooperative supplies poultry feed to member farmers in Sullivan, Ulster and Orange counties in New York. In addition to furnishing members with a wide range of poultry and staple farm supplies, the organization also has an egg processing and marketing division.



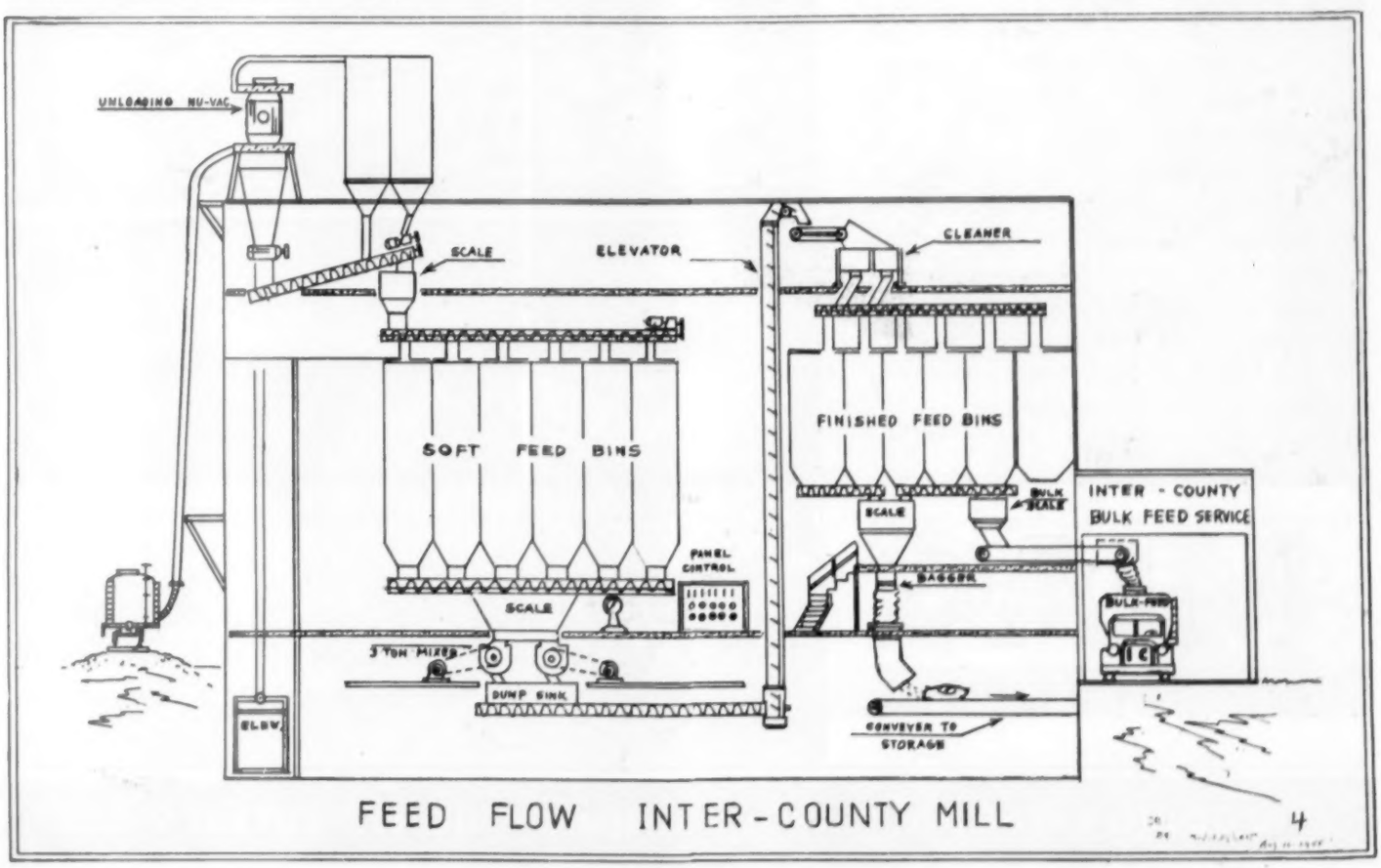

The feed plant of the Inter-County Farmers Cooperative Assn. at Woodridge, N.Y.

Albert Cohen, general manager of Inter-County, said the new mill, which was opened last fall, represents the culmination of 20 years of progress. The cooperative got its start in 1935 when a small group of poultry farmers joined in purchasing a carload of feed.

Subsequent growth led up to the building and operation of the new feed mill.

The first phase of the planning and construction of the new feed plant took place in 1950, when a grain storage and grinding house was planned. This facility, designed and equipped by Sprout, Waldron & Co., was completed in 1951. Storage space for 100,000 bu. of grain was made available in this building, of monolithic construction.

The grain house was located in re-



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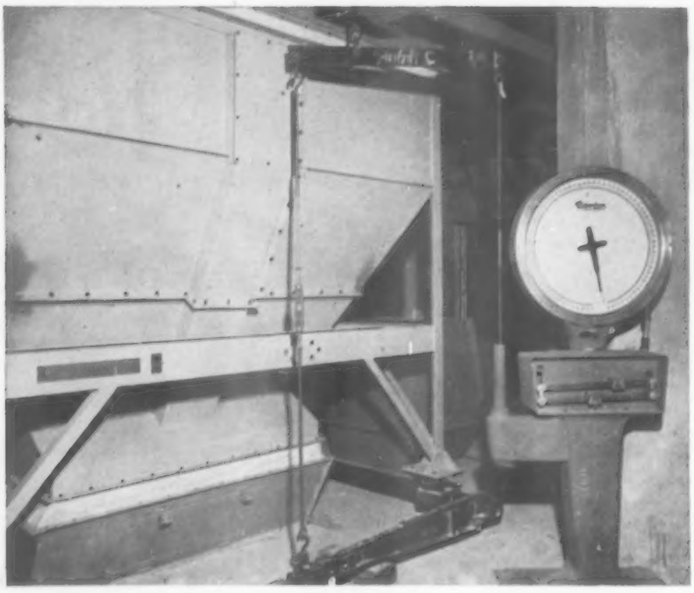

The 6,000-lb. hopper for collecting ingredients.

lation to the future site of a complete new mill, with material handling, cleaning and grinding and other grain processing located and designed for eventual connection to a new feed processing facility.

The new mill was designed by Sprout-Waldron in cooperation with the Richardson Scale Co. The former supplied the grinding, mixing, pelleting and other equipment, and the latter supplied the scales and packing equipment and built the electronic automatic control panel.

One of the features of the mill, in addition to the automatic processing, is a belt conveyor system for distribution of bagged finished feeds which includes a vertical belt lift for bags.

The mill building, 48 by 52 ft. and approximately 100 ft. in height, is of monolithic slip-form concrete construction, joining the previously constructed grain house so that both buildings are as one. The walls, bins and roof were poured in 10 days. The building was constructed by the Nicholson Construction Co. of New York City.

Within the building and as an integral part of its design and con-

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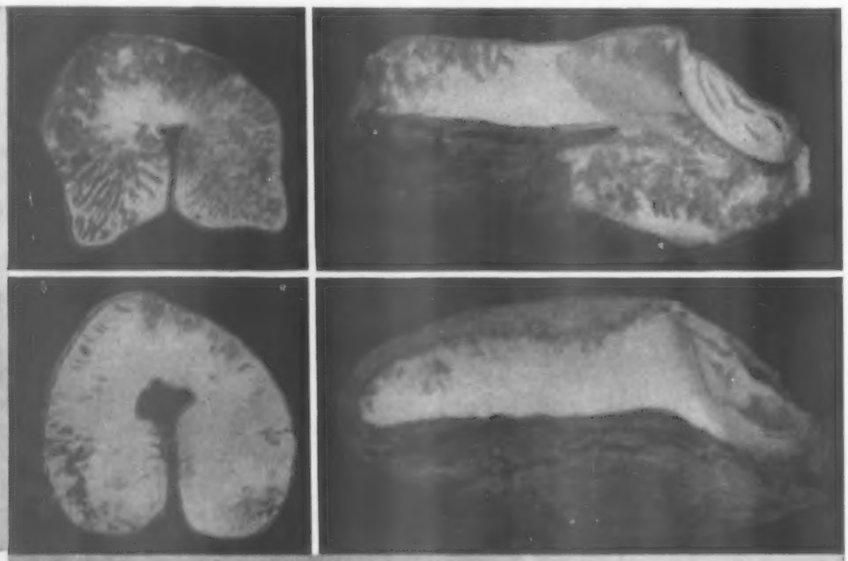

top picture: prior to conditioning/bottom picture: after conditioning

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struction are 26 bins that hold more than 1,700 tons of bulk feed ingredients. There also are 14 bins that hold more than 400 tons of finished feeds ready for distribution in either bagged or bulk form.

Grains for processing are received by both rail car and trailer truck, unloaded by power shovel to the grain house where they are weighed on an automatic grain scale, cleaned and distributed to various bins.

Other feed ingredients are received in bulk rail cars and trucks and are unloaded by a Sprout-Waldron pneumatic system, elevated by air to the top of the mill building, weighed and distributed to the various holding bins through a system of spiral screw conveyors.

Installed in each bulk feed bin is a high level "Bindicator." These bin level indicators, interlocked in the control panel on the first floor, warn the operator by a red signal light and audio signal that the bin is filled. An audio signal is also located near the unloading point. This warns the unloading operator.

Grain grinding equipment is located in the grain house directly beneath the grain storage bins and includes a 100 h.p. hammer mill and an 80 h.p. double disc attrition mill. Both mills discharge ground products to manifolds of individual 40 h.p. "Pneu-Vac" systems located on the mill building roof, each discharging by gravity to one of four bulk feed holding bins.

Scratch grains are also processed in the grain house and transferred to holding bins in the mill for bag or bulk feed delivery.

The actual proportioning and mixing of the feed components is controlled through the control center which is the heart of the mill. In fact, every operation in the mill is either channeled to this section or stems from it.

An electronic automatic batching panel designed by Richardson in cooperation with Sprout-Waldron engineers controls from a single point four distinct functions of the mill—batching, mixing, bin control and distribution.

Thus, the control panel makes possible one-man control of the processing operation in the new mill. The panel is divided into three sections. One shows the loaded condition of the ingredient and finished product bins throughout the mill; another controls the blending and mixing of up to 17 different ingredients into accurately proportioned poultry feeds, and a third controls remotely the operation of elevators, conveyors and gates for distribution of finished products to storage bins for bagging, bulk shipment or pelleting.

### Proportioning and Mixing

The operator sets up a desired formula by adjusting the proper weight selector dials. Each selected ingredient is drawn in sequence from the bulk storage bins, through feeder screws controlled from the panel, and discharged in proper weight to a 3-ton weigh hopper, which in turn discharges automatically and alternately to either of two 3-ton batch mixers. These mixers, following a pre-determined mixing time, are also controlled through the panel, discharging in turn to a large surge or holding bin located underneath, the completed mixing cycle being approximately four minutes. When a cycle is completed, it automatically repeats until a predetermined number of batches, as set up on an automatic batch counter, has been produced. Thus completed, the system shuts off automatically and is ready for another pre-set formula.

A pilot light system is included which enables the operator to follow the batching procedure step by step through the process and to observe that all motorized equipment in the system is functioning. In the event of any motor failure, inaccurate or feed shortages to the scale, off-tare weight or failure of any equipment in the system to function in its proper sequence, the system shuts down, a red light pinpoints the trouble, and an alarm alerts the operator. The trouble is located and rectified, and the system continues automatically.

A system of air-controlled discharge gates is interlocked in the panel. Located on the scale hopper and mixers, these are operated through mercoid switches in proper sequence.

### Distribution of Feed

The panel also controls the distribution of finished feed, as air gates and bin level indicators are also interlocked in the panel. This enables the operator to choose the proper holding bin direct from his station.

From the surge bin under the two mixers, the process is conventional, the mixed feed discharging to an elevator, from this over a magnetic field, and through a Gyro-Whip scalper or feed dresser.

Provisions have been made for the inclusion of fat and/or molasses, both ingredients also controlled and proportioned in predetermined amounts through the batching panel.

Pellets are being produced on a Sprout-Waldron pelleting system which includes pneumatic pellet handling, cooling and drying, crumblizing and grading.

Richardson Duplex scales are used

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**INSIDE SCIENCE**

# The Vital Story of Vitamin $B_1$

(Thiamine)

*by* Science Writer

**History.** The discovery of vitamin $B_1$ resulted from research into the cause of beriberi. Almost 50 years passed between Eijkman's discovery of the relationship of the disease to diet and the famous work of Jansen and Donath who first isolated the crystalline vitamin from rice bran.

Within ten years of that first isolation the vitamin's chemical structure was determined and it was successfully synthesized.

Eijkman's work resulted in the development of a theory that beriberi was caused by a lack of some factor in the diet and not by a toxin or infectious agent. This idea was not readily accepted until the growth of dietary knowledge proved it correct.

**Isolation and Synthesis.** In 1926 Profs. Jansen and Donath accomplished the isolation of crystalline vitamin $B_1$ from rice bran. In 1931 Windaus and co-workers successfully isolated pure vitamin $B_1$ and established its empirical formula. In 1936 R. R. Williams, and independently R. Grewe, explained the vitamin's chemical structure. That year, R. R. Williams and J. K. Cline accomplished the synthesis of thiamine which is in wide use today. Andersag and Westphal also synthesized the vitamin in 1936. Another synthesis was described by Bergel and Todd in 1937.

Photomicrograph of $B_1$ crystals

**Chemical and Physical Properties.** Thiamine hydrochloride is white, water soluble, with a nut-like, salty taste and yeast-like odor. Its empirical formula is: $C_{12}H_{17}ClN_4OS \cdot HCl$. Thiamine produced by synthesis is identical chemically and in biological activity with that obtained in pure form from nature.

**Deficiencies.** A deficiency of thiamine is characterized by these symptoms: depression, irritability, fearfulness, lack of initiative and interest, loss of appetite. Symptoms vary since in usual practice deficiencies of other water-soluble vitamins occur. Medical treatment is simple: a sufficient amount of thiamine is administered to relieve symptoms quickly and the physician provides for a continuing adequate intake.

Beriberi victim

A severe deficiency of thiamine leads to beriberi, a serious and sometimes fatal disease. While beriberi is almost a medical curiosity in the United States, it is common in countries in which polished white rice is a staple of the diet.

**Human Nutrition Requirements.** Thiamine is one of the nutritive elements the human body needs daily and does not store in quantity. The minimum daily requirements established by the U. S. Food and Drug Administration for the prevention of symptoms of thiamine deficiency disease are:

| | | | |
|---|---|---|---|
| Adults | 1.00 mg. | Children (1-5 incl.) | 0.50 mg. |
| Infants | 0.25 mg. | Children (6-11 incl.) | 0.75 mg. |

The Food and Nutrition Board of the National Research Council recommends the following dietary intake of thiamine for healthy persons in the U. S. A.

Recommended Daily Intake in Milligrams

| *Age* | *Men* | *Women* |
|---|---|---|
| 25 | 1.6 | 1.2 |
| 45 | 1.5 | 1.1 |
| 65 | 1.3 | 1.0 |
| Pregnant (3rd trimester) | | 1.5 |
| Lactating | | 1.5 |

The Council recommendations for infants and children vary below and above these figures, based on age and sex. Various illnesses and stress situations can exhaust vital reserves of thiamine. So, for the physician, vitamin $B_1$ is prepared in various dosage forms and potencies for therapeutic and prophylatic use.

**How do human beings receive thiamine?** It is widely distributed in foods of animal and vegetable origin, particularly cereal grains and dry legumes. Because of public demand for refined products which millers must meet for obvious economic reasons, a loss of thiamine and other factors occurs during processing. The thiamine loss is overcome through the use of *enrichment* in cereal grain products for which Federal Standards exist, or in other foods such as breakfast cereals, by *fortification* or *restoration*. When enriching, fortifying or restoring, the food processor adds the necessary amount of pure thiamine (and other vitamins and minerals) to the food so that the finished product meets Federal, state and territorial requirements or contributes to the consumer an amount of the vitamin which dietary experts believe significantly useful.

Thiamine is extensively used for the enrichment of cereal grain foods such as white flour, white bread and rolls, macaroni products, farina, corn grits and meal, milled white rice. The story of these uses is delightfully told in a separate brochure which is available on request for reference or educational purposes.

**Production.** Huge production facilities at the Hoffmann-La Roche plant in Nutley, New Jersey, deliver highest quality thiamine *by the tons*. Roche manufactures thiamine hydrochloride and thiamine mononitrate. These fine products, which equal or exceed U.S.P. specifications, are ideal for use by pharmaceutical makers and food processors. Years of experience in research and manufacture have made Roche the leader in vitamins.

This article is published in the interests of pharmaceutical manufacturers, and of food processors who make their good foods better with essential, health-giving vitamin $B_1$. Reprints of this and others in the series are available on request. Write the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec.

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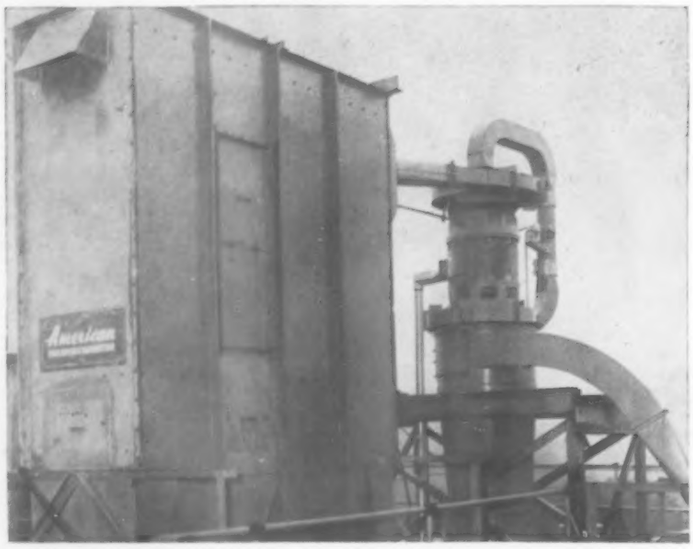

The main "Pneu-Vac" for receiving ingredients, showing dust tube collector.

for packing mash feeds and automatic bagging scales for pellets, crumbles and scratch feeds.

**Handling Bagged Feed**

Distribution of bagged feeds from mill to warehouse is through a system of belt conveyors in which is included for the first time, the firm believes, a vertical belt lift for bags.

From the bag closing machines, the filled bags drop through the floor to a collecting belt. They discharge from this at a right angle to a transfer belt which carries them 24 ft. through an underground tunnel, delivering them through a flattening device to the vertical bag lift.

This vertical unit, conceived by Sprout-Waldron engineers and designed and furnished by the Stewart-Glapat Co. of Zanesville, Ohio, elevates the bags of feed between two special finger type rubber belts, held under adjustable tension, to a height of 45 ft., where the bags are discharged to a horizontal delivery belt in the top of the warehouse. Four plow-off stations are located along this latter belt, with specially designed slides that deliver to any one of three warehouse floors and/or to delivery trucks.

**Small Amount of Labor**

Inter-County officials said that, excluding supervision, just 12 men operate the mill.

They include four men unloading grain and bulk feed components; one grinder who also operates in supervising the bin loadings; one man in charge of the batching panel; one pellet mill operator and bagger; two men bagging mash and sewing, and three men in the warehouse, for a total of 12 in these operations.

Based on full production of 60 tons per hour (all types of feed), actual production, the officials say, is then at a rate of .20 man-hour per ton.

A fleet of 10 trucks makes deliveries of bagged products. In addition to these, four Sprout-Waldron bulk feed trucks make daily deliveries to farmers who have installed bulk feed bins in their poultry houses. Mr. Cohen said that within a year, some 50% of the new mill's production will be delivered in bulk.

——BREAD IS THE STAFF OF LIFE——

**For the first 10,000 years of bread's existence it was unleavened—a solid cake of crushed grain with water, salt and perhaps fat added—and death on molars. Mummies found in Egypt had teeth worn to the gums from the roughly ground grain. Sand in the loaf, rubbed off the millstones during grinding, aggravated this molar erosion.**

## 32-YEAR-OLD SAMPLE STILL GOOD

**MADISON, WIS. — A 32-year-old sample of Larvacide, a trademarked fumigation product of Larvacide Products, Inc., produced a 99.5% stability yield in an analysis, according to a report made by the Badger Safe Protector Co., Madison, Wis. A 29-year-old sample produced a 97.3% yield and a seven-year-old sample made a 99.5% yield, it was reported. The three samples were taken from Badger's glass burglar units, the older two being redistilled commercial (pure) and the seven-year product being from the regular run of the product.**


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# Enrichment's Dr. R. R. Williams Honored by Nation's Scientists

WASHINGTON—One of the country's eminent scientists, Dr. Robert R. Williams of New York, was honored by fellow scientists for his valuable contribution to the improved health of mankind at a dinner recently at the Mayflower Hotel.

The American Institute of Baking in Chicago was host for the occasion which marked the 20th anniversary of the synthesis of thiamine (vitamin B1) by Dr. Williams. It also marked the 15th anniversary of bread enrichment which was made possible through Dr. Williams' discovery. Thiamine deficiency symptoms, prevalent before enrichment, now are almost unknown in this country.

Dr. Williams was the first to determine the chemical structure of and to synthesize thiamine, making possible its manufacture in quantity. His experiments began in 1911 and the actual break-down of the chemical structure was completed in 1936. Much of his early work on thiamine was done in the Philippines, but his contribution to the enrichment programs in the U.S., Puerto Rico, Cuba and other areas is widely recognized. For the past decade, Dr. Williams has been director of grants of the Research Corp. of New York.

Several of Dr. Williams' scientific colleagues from other countries were among the several score of scientists, nutritionists and baking industry representatives at the Washington dinner to pay tribute to his everlasting contribution to the health of mankind. Paying personal tribute to his scientific efforts were Dr. Russell M. Wilder, an emeritus member of the staff of the Mayo Clinic and Dr. William H. Sebrell, former director, National Institute of Health.

**Health Gains and Enrichment**

Speaking on the "Fifteen Years of Enrichment of Flour and Bread," Dr. Wilder pointed out that, "The average diet, after enrichment of bread and flour became general, contained almost twice the amount of the vitamins, thiamine, riboflavin and niacin it had before, and also additional iron. The resulting gains in health are conspicuous.

"The frank deficiency diseases, beriberi and pellagra, almost disappeared. For example, among 10,000 recent admissions to the Hillman General Hospital in Birmingham, Ala., not one patient with pellagra was found—this is an area in which pellagra previously was rampant. In a large general hospital in Chicago, where beriberi at times was observed in former years, a systematic search, over a three-year period, failed to bring to light a single case of beriberi.

"Likewise, in 1948 and 1949 a survey was conducted among some 16,000 inmates of the Chicago House of Correction which revealed only two cases of pellagra and three of ariboflavinosis—no beriberi. A point of special interest in this Chicago study was that the decline in the prevalence of these vitamin deficiency diseases started very shortly from the beginning of enrichment of Chicago's bakery bread. Also, between 1946 and 1950, a number of nutrition surveys were conducted in various areas of the country: surveys of family groups, of factory workers, of school children and others. Among the thousands then examined hardly any frank deficiency disease was detected."

In paying homage to Dr. Williams, Dr. Sebrell said that, "There are many men who accomplish great things in research but it is a rare combination that is found in Bob Williams of research ability, coupled with the determination and drive to follow up his research accomplishments with their application for the lasting benefit of mankind. His life really has consisted of several careers at the same time, but running through it you can see the path which led to the attainment of that rare satisfaction that so few men have the opportunity to experience—of seeing the results of their work improve the lot of much of mankind.

"It has been one of the great inspirations of my life to have had the opportunity to be associated with Dr. Williams in a small way for many years and to have been guided by his wisdom and experience on many occasions. I know that all of his associates will continue to look to him for advice and to call on him for help with the problems of human malnutrition which we know are so close to his heart.

"In conclusion, to my mind Dr. Williams represents the best that religious freedom, intellectual freedom and political freedom can produce. In the troubled times that we see ahead of us in the world, if this country can continue to produce men of Dr. Williams' caliber we have

(Continued on page 12a)

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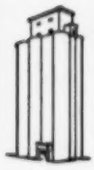

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# Planning Today's Promotion Policy

● By Ernest W. Fair

Handling employees has become almost a science today by sheer necessity. Some years back haphazard methods could be used without too much damage in any mill. Not so today. The absence of such an important thing as a planned promotion policy based on tested principles of merit may result in the loss of the top segment of the firm's staff.

Each program for promotion must be based on individual considerations of each specific company. Applying a generalized system will not only prove inadequate from the management standpoint but that of employees as well. Almost without exception it has been recognized that good promotion policies today are custom tailored to fit one's individual firm.

However there are several factors which should be an important part of any such policy. These are being proven in today's experiences. Their use is bringing results today; their absence costing every firm failing to use them profits in the form of loss of top personnel as quickly as the men and women develop to full efficiency.

Here are the major policies which belong in each flour milling company's promotion program. As stated above they should be adapted to the individual local requirements of each concern.

Set up a published policy of promoting from within the company organization. It's the only way to hold onto good employees to begin with as a policy. Many firms work on such a basis but never bother to inform new personnel of such a policy. As a result many a good individual, brought to peak efficiency after an expensive training period, is lost to competition before he or she finds out about such opportunities within our own organization.

This should be clearly set forth to the employee at the time he or she is hired. It should be repeated by every means we have available and particularly emphasized by actual practice and seeing to it that everyone on the staff knows about every such promotion actually made "from the ranks."

Such knowledge that deserved promotions are being made always increases the interest of other employees in the company as well as their desire to serve the interests of the firm. Experience has definitely shown that it also causes other employees to hold that their turns will come next—therefore they remain with the flour milling company and labor turnover is reduced.

### Acknowledge Seniority

Use seniority but not as the sole standard for promotion. Many firms are using a straight seniority rating as a basis for promotion with the new job going to the oldest employee. This holds in many union contracts.

It is not, however, a good sole basis for promotion. Too often it passes over a much more qualified individual and it also serves to discourage ambitious younger men and women on the staff.

In actual practice most firms are finding that seniority coupled with ability is a better standard to follow. Some frequently give the eligible individual a week or ten days in which to qualify for the job. Others hold examinations for such posts among the top ten or twenty on the seniority list. This helps make certain that the best available individual is secured for the job rather than simply the oldest on the staff at the time.

Make certain the qualified employee gets the first chance at the job. Where we fail to follow such a policy we may as well not have any promotion program for the whole structure is destroyed by overlooking the best qualified man or woman when a promotion becomes available.

No matter how much a man or woman may love the work they are doing the best incentive for them is still the hope for a better job and more salary. Each time promotion is made on an individual obviously less qualified than others faith in such a future is destroyed for that particular employee.

Opportunity to learn the required information needed to hold the better job should be made available to those men and women who are in line for promotion to that position. Where the nature of their work stifles such an opportunity we not only make it difficult for them to attain personal goals but the company will lose through promoting unqualified individuals. It is much easier to learn ahead of the job than while on it and particularly so in the case of any executive position—even a minor one.

An understudy system of promotion is today being used by many concerns and deserves consideration in our own promotion policy. Under it particularly eligible personnel are given the opportunity to work at the tasks that would be required of them in the next eligible position. This not only shows the employee that the firm has faith in his or her future and that he or she has a definite opportunity for promotion ahead but it also helps to train such individuals in advance so that little break-in will be required when the promotion is actually made.

### Avoid Hunches

Keep the "hunch" system out of the promotion program. Such a policy can be too easily influenced by current events or happenings during the week closest to the time of actual promotion. Every firm should have an organized program to implement its promotional system through personnel records which can serve as a guide for promotions at any time. Thus the executive always has the whole picture before him and not that most recent in his mind. Such records should be kept by even the smallest flour milling company organization.

Promote on his or her qualifications for the new job—not the old one. This has been one of the gravest mistakes made in business. We too often judge an individual solely on top performance in the post now being held. This can never be assurance that he or she will be as good on the next step up the ladder.

It is always safest to consider not only his or her qualifications on the job now held but also that on the new job. Doing so gives us more assurance that the person we select will be the right individual.

Superior employee performance should be carefully judged for its reality. In many instances a picture of such performance can be woven without it actually existing beyond a primary degree. It is always good policy to make certain not only that the employee's performance has actually been superior but that this superior performance has been typical of that particular individual.

Tests are sometimes advisable before a definite promotion is made. These may be in the form of written


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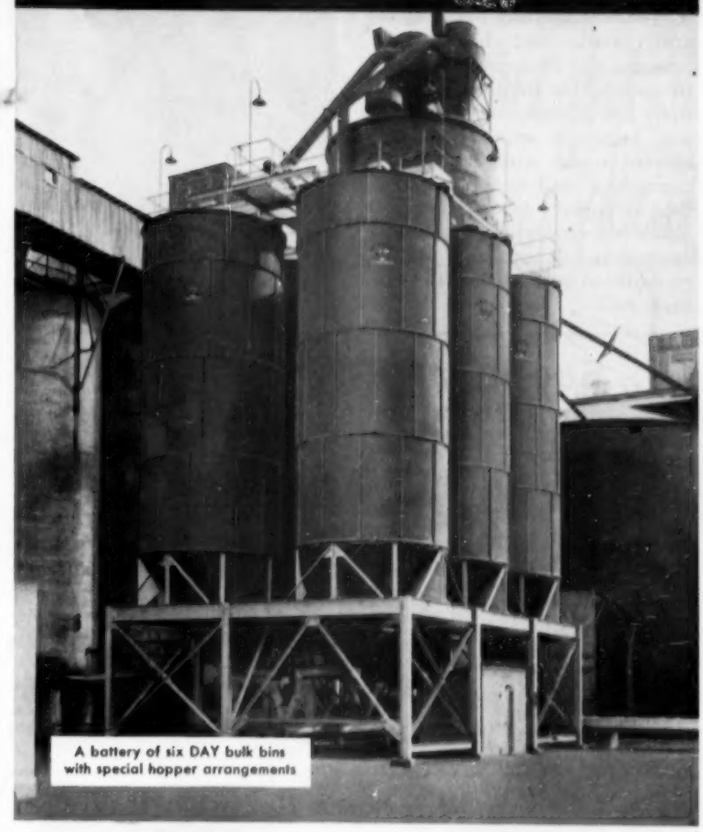

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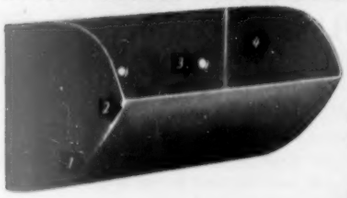

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examination to ascertain how much of the required knowledge and skill each individual actually has for the job under consideration. A more practical form is to try out the employees being considered in the more important duties for which they appear to be qualified. In most cases this can be done by giving out specific assignments without letting the employee know that he or she is under consideration for such a promotion. Following this course will give us a truer and more accurate picture than if the employee is told that the test involves a possible promotion.

In addition it has been found good procedure to also sell the promotion policy to employees as being a good one, to use employee progress reports where possible or even a formal merit rating plan and to provide definite lines of promotion.

Each of the foregoing factors should have an important part in any flour milling company program or policy. They form the basic framework to which can be added others of specific concern to the individual company.

—BREAD IS THE STAFF OF LIFE—

### FUMIGATION HAZARDS

The fumigation of large bulks of stored grain becomes hazardous if fumigators are exposed to high concentrations of the gas. Personal hazard can be largely eliminated by using power-operated equipment that will speed application. Officers at the stored product insect laboratory, Canadian Department of Agriculture in Winnipeg, Man., have devised portable spray equipment with which it is possible to apply fumigant at a rate of 10 gal. a minute. A bronze gear pump is driven by a 3.5 H.P. gasoline engine. Fumigant drawn into the pump through a 1 in. plastic tube is discharged through a ¾ in. rubber hose. This equipment should make it possible to apply liquid fumigants to stored grain from open doors or ventilators without having to enter the building, the laboratory states.

## DR. R. R. WILLIAMS

(Continued from page 9a)

nothing to fear, and the world will be a better place for us all."

**Scientific Discoveries Noted**

In addition to his research work on thiamine, Dr. Williams worked as a chemist in the Bureau of Science in Washington during World War I, and invented the processes and developed the materials for the insulation of submarines and underground cables. For a number of years, he was director of laboratories for the Bell Telephone Co. In 1940, he became chairman of the Williams-Waterman fund for the combat of deficiency disease and later director of grants of the Research Corp.

Born 70 years ago in Nellore, India, of American missionary parents, Robert Williams was educated in this country. He attended the University of Ottawa, Kansas, transferred to the University of Chicago, and received both a B.S. and M.S. degree. While on leave from the Philippines in 1912, Dr. Williams married Augusta Parrish. They have four children: Robert Reynolds, Elizabeth Alice, Jean Parrish, and June Augusta.

Seven colleges and universities have granted Dr. Williams honorary Doctor of Science degrees, and he has been the recipient of numerous medals and awards.

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# Method of Testing for Carbon Bisulfide In Carbon Tetra Chloride

By Arvid J. Kuutti
Cargill, Incorporated

There is some need for a rapid method to determine the carbon bisulfide content in carbon tetra chloride as found in insecticides.

The following method is based on the princip'e that carbon bisulfide forms a quite stable xanthate with sodium hydroxide in alcohol.

$$CS_2 + NaOH + CH_3OH \rightarrow S{=}C(OCH_3)(SNa) + H_2O$$

Methods using this reaction have been published. However, this method greatly simplifies the tests which we have, heretofore, tried. This method is, therefore, published for laboratory convenience.

**Equipment:** 1-50 ml. burette, 3-4 100 ml. volumetric flasks, 5-6 250 ml. glass stoppered erlenmeyer flasks, 1 pipettor, 1 10 ml. pipette, 1 5 ml. pipette.

**Chemicals:** Carbon tetra chloride, carbon bisulfide (C.P.), sodium hydroxide A.R. pellets, methanol, phenolphthalein indicator soln. 1%, .1 normal sulfuric acid soln., .1 normal sodium hydroxide soln.

**Solutions:** Alcoholic sodium hydroxide, add one and one half grams of sodium hydroxide A. R. of pellets to 100 ml. of methanol and allow to dissolve completely. (It is important that all the sodium hydroxide is dissolved in the alcohol.)

Standard carbon bisulfide, carbon tetra chloride is made by mixing 20 ml. of carbon bisulfide with 80 ml. of carbon tetra chloride.

**Procedure:** With pipettor and 5 ml. pipette, transfer 5 ml. of unknown insecticide into a 100 ml. volumetric flask. Add carbon tetra chloride up to 100 ml. mark and mix. Pipette 10 ml. of a'coholic sodium hydroxide into a 250 ml. glass stoppered erlenmeyer flask. This is the blank determination. Pipette 10 ml. of alcoholic sodium hydroxide into a second 250 ml. glass stoppered erlenmeyer flask. To this flask with a pipettor on a five ml. pipette, transfer 5 ml. of unknown and carbon tetra chloride solution from the 100 ml. volumetric. Stopper tightly, swirl gently so that the two solutions mix thoroughly. Allow the reaction one half hour to go to completion.

**Titration:** 1. Blank—Add 4 drops of phenolphthalein indicator to the 250 ml. erlenmeyer flask containing the blank. Titrate with .1 normal sulfuric acid to measure the total alkali present. Record this amount. (Record 1.)

2. Sample—Add 4 drops of phenolphthalein indicator to the 250 ml. erlenmeyer flask containing the sample. Titrate with .1 normal sulfuric acid until the color exactly changes from violet to clear. Record this amount below the first record. (Record 2.)

**Correction for sulfur dioxide:** To a third glass stoppered erlenmeyer flask add 25 ml. of distilled water and 5 ml. of the unknown insecticide and carbon tetra chloride solution. Add two drops of phenolphthalein indicator and titrate with .1 N sodium hydroxide. Record the titration. This will be the correction for sulfur dioxide. (Record 3.)

**Calculation:** Subtract Record 3 from Record 1 to correct for $SO_2$ present.

Subtract Record 2 from the above difference. This is the amount of .1 N equivalent volume used in the formation of the xanthate.

Example: Total NaOH in 10 ml. of alcohol (as ml. .1 N $H_2SO_4$) minus $SO_2$ correction (as ml. .1 N NaOH).

Equals total NaOH usable (as ml. .1 N $H_2SO_4$) less unused NaOH (as ml. .1 N $H_2SO_4$).

Equals vol. .1N equivalent of NaOH used by xanthate (as ml. .1N $H_2SO_4$).

Liter vol. .1 N equivalent used × .1 = number of chemical equivalents.

No. of C. E. × 76.13 = wt. in 5 ml. soln.

Molecular wt. of $CS_2$ = 76.13.

Specific gravity of $CS_2$ = 1.26.

Now the % by vol. of $CS_2$ =

$$\frac{\text{wt. in 5 ml.} \times 20 \times 20}{1.26}$$

Analysis of the prepared standard carbon bisulfide carbon tetra chloride mixture can be used for checking the procedure.

—BREAD IS THE STAFF OF LIFE—

**For a fairly active man of 25, 5 feet 7 inches tall and weighing 143 pounds, six slices of enriched bread will supply 21% of the iron he should have daily, 16% of the calcium, 19% of the protein, 22% of the thiamine and 20% of the niacin.**

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To Save the Grain that Feeds the Nation

# New Conception of Electrical Industrial Control

**By Robert Schadt**

You have probably heard of the name of a new concept in industrial control known as "CYPAK." What is it? Why was it developed? How does it work? Where can it be used?

These are just a few of the questions to be answered to remove the mystery from and develop increasing interest in CYPAK. First let us examine the electrical control of industrial machines as it exists today.

As you may know a large portion of such controls contain relays, and these relays since their introduction in 1836 have been able to serve a constantly growing and changing range of applications satisfactorily. The relay is considered to be a step or digital device having two states either "on" or "off."

Any such device provides memory since once external conditions place it in one position it retains that position until the external conditions are changed. Thus the ability to remember along with comparative insensitivity to change in other devices, such as resistors, used in conjunction with it and the ability to amplify or change its output as compared to its input were advantages which made the relay a versatile industrial control tool.

However, we are living in an age of ever increasing complexity and the control of industrial machines is no exception as manufacturing processes are speeded up and, in some cases made completely automatic. Such control is demanding more and more cycles from the relay and at the same time greater and greater reliability. The maximum expected life of the relay already is reaching the point of saturation. To place such a device in a sequence of events where a breakdown may cost from $100 to $1,600 a minute was becoming industry's nightmare.

To eliminate this nightmare and formulate a device with no moving parts, no contact surfaces, and an extremely long trouble-free life was the purpose of developing CYPAK.

First, you may be interested in the name. About 1948, Prof. Weiner, Massachusetts Institute of Technology, coined a new name, Cybernetics, to mean the science of the transmission of intelligence. Prof. Weiner had some help from mythology where we find Cybros was a helmsman, a director of the ship. Later you will see that the elements used are packaged, thus packaged cybernetics or CYPAK.

Second, I am sure you are interested in the elements used in these packages. They are not new for if you examine one of the boards you will find resistors, selenium rectifiers and miniature high grade transformers. Each of these components has over the years proven its reliability and insensitivity to change. Their life is not dependent on the number of operations they perform, but rather is determined only by elapsed time and how hard they are being driven electrically. To further increase this life all components are subject to approximately 50% of their normal ratings. The CYPAK elements are designed to work at very low power levels to maintain minimum size.

### Logic Functions

Before considering the combination of the before mentioned components into CYPAK elements, it is necessary to become familiar with logic functions.

And you may well ask, "What does this logic stuff have to do with CYPAK?" Strange as it may seem, it is the basis on which CYPAK is founded and a tool that you yourself have undoubtedly used. A relay schematic not only represents the use of contacts in series, but also illustrates the logic "and" function. For only if "A" and "B" and "C" are closed do we have "D" functioning. This operation is duplicated in CYPAK by the "and" unit. Where, if input "A," and input "B," and input "C" are present output "D" is obtained. I trust that all of you can distinguish between the "and" element and the "feminine" element. The use of relay contacts in parallel is the basic "or" circuit for if relay

**EDITOR'S NOTE: Mr. Schadt is a member of the staff of the Westinghouse Electric Corp., Chicago. His paper was presented before a recent meeting of the Chicago Millers Club.**


ANTIBIOTICS AND FLOUR HAVE THIS IN COMMON . . .

As with any substance whose end product is powdery or granular, sifting is a major concern.

Pharmaceutical manufacturers in overwhelming numbers, as well as millers, have found that SWISS SILK is the ideal medium for their fine sifting.

Anyone with a sifting problem naturally turns to SWISS SILK for we are the world's oldest and largest suppliers of fine sifting textiles.

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LET DOTY DO IT
If Your Lab Is Overloaded
Sanitation Analyses - Wheat and Flour
Doty Technical Laboratories
KANSAS CITY 13, MO.

"A," or relay "B" or relay "C" is energized "D" functions. The CYPAK "or" unit has an output "D" when input "A" or input "B" or input "C" is present. The logic "not" function is represented by the normally closed (relay deenergized) relay contact. Thus with relay "A" deenergized, contact "A" is closed and "B" functions. And in CYPAK "not" element with no input an output is obtained. Last, but not least, of the logic elements is the "memory" function as in a latched-in relay. Closing P.B. "A" picks up relay "C" and a contact of the relay closes around the P.B. "A" circuit while another relay C contact causes D to function. In CYPAK the memory element with input "A" produces and continues to produce an output (even with input "A" removed) until input "B" is applied. You may have noticed the one main difference between a CYPAK element and a relay. In the relay one input results in a number of outputs. In CYPAK several inputs result in one output. Let's work up an illustration!

**We Want a Drink**

Let us say that it is a martini we want. In order to have a martini as an output circuit, certain input conditions must be met: First of all, we must have gin, we must have vermouth, we must have an olive and we must have ice. Let me go back over that statement and accent a particular word. In order to have a martini, we must have gin and we must have vermouth, and we must have an olive, and we must have ice. The very fact that I emphasized the word and indicates that in order to get an output of a martini, we must run these four inputs through an "and" circuit.

Now, instead of a martini, let us say that we want a scotch and soda. In order to have a scotch and soda as an output circuit, our inputs must be scotch and soda and ice. Now nobody in his right mind is going to drink both the martini and a scotch and soda simultaneously. He is going to drink one or the other. The fact that I said or indicates that we must take the outputs from the two "and" circuits and feed them through an "or" circuit. When this is done, we get our output of a drink.

Now let's establish a few more conditions on this. Suppose we have a teetotaler in our midst. If we have a teetotaler, he will not want either a martini or a scotch and soda. Again the fact that I said the word not indicates that we can use teetotaler as an "input" circuit, run that through a "not" circuit and apply that condition and the drink condition to another "and" circuit and come out with our drink.

**Memory**

Now what about the "memory" or the "flip-flop" circuit Contrary to common belief, the "flip-flop" circuit is not applied after you have had several drinks, but applied before you had the drinks. This is an illustration of how this applies. Let us say we have some drinkers who are a little finicky about when they drink. For example, let us say that they do not drink before breakfast. Their drinking hours are confined to the period from breakfast until midnight. This is an apt application of a "memory" circuit then. As you will recall the "memory" circuit is divided into two parts. An "on" and an "off" condition. Therefore, we can apply to the "on" condition the input condition of breakfast to midnight and to the "off" condition, before breakfast. Again we must apply the output from our "or" circuit and the output from our "memory" circuit through an "and" circuit in order to get our drink.

Using a drink to develop a logic system is extremely facetious. However, an example of this type may be retained in your memory longer. And, don't overlook the fact that, we were able to design this system by merely establishing the input-output requirements and listening to the sound of our words. In practice it's a little more difficult than this.

However, to illustrate a more practical application suppose there are two tanks A and B in which the level is to be controlled through valves A, B and C. Only one tank can be filled at a time and tank A is preferred.

With both tanks full the NOT elements receive signals from their corresponding level sensers and deliver no output to the valve operators. If tank B level is low the AND element receives an input signal from NOT element B as well as from level senser on tank A and delivers an output to valve B operator and through the OR element to valve C operator. If tank A level becomes low, the AND element receives no input signal from level senser on tank A and thus ceases to deliver an output to valve B operator. Thus valves A and C are now open and tank A is being filled. This same control could be accomplished with relays, of course, but CYPAK offers a circuit with tremendously increased reliability. So let us proceed to the theory behind the CYPAK elements!

(Continued on page 18a)


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For All Roll Corrugating
Economical Increased Output
**CORRALLOY TOOL CO.**
Minneapolis 7, Minn.



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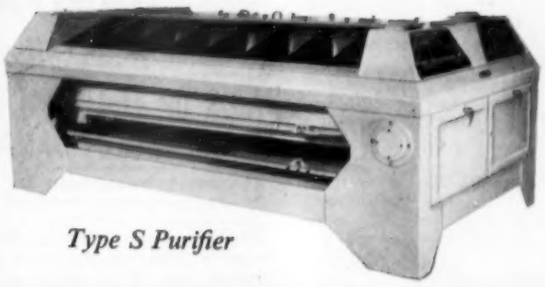
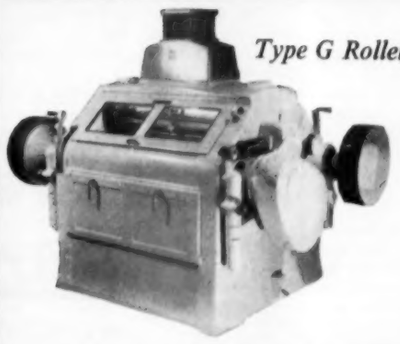
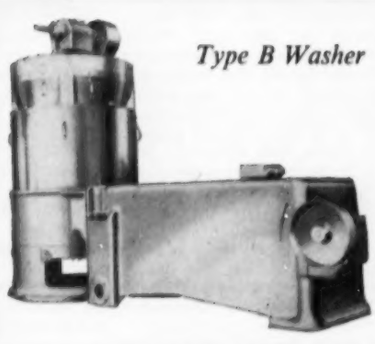


*Type S Purifier*

You don't just buy these new, up-to-date Simon machines. You invest in them—and they pay off fast in lower overheads, more and better production, bigger sales, higher profits. Find out more about them from the Simon man—today! Here are just a few in the range.



*Type G Rollermill*



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**NEW EQUIPMENT—The first picture shows a view of the sifter floor. On the left are the new British type sifters, with the older American sifters on the right. The next shot is of the purifier floor and on the right is the duo-sifter machinery before the first break. This machine, with two Entoleter Scourer-Aspirators, is useful for a final treatment of durum. The pneumatic plant works with two standard installations.**

## NEW CANADIAN PNEUMATIC MILL

(Continued from page 1a)

The purifiers are all-aluminum machines, with single and double sieves respectively, making provision for flexibility in the take-off of farina and semolina. The sifting surface is provided by existing American sifters augmented by two Flowmaster sifters, and the bran and shorts are finished on Simon Bran Finishers. These machines, recently redesigned to increase the screen surface available, permit the maximum final recovery of stock released by the beaters.

The pneumatic conveying in the mill uses diffusers, and is incorporated in two systems. Space in the building was very limited, and the Aerofoil fans used have been very helpful in overcoming the installation problems. An improved type of motor has been developed for the Aerofoil fans to enable them to deal with the arduous conditions existing in the plant and it has performed very efficiently since installation. Real flexibility is provided by the pneumatic system. A power cut recently caused the mill to shut down under full load: automatic ejection of the stock in all the elevating pipes resulted in the discharge of only 50 lb. of stock, and a visiting miller who was looking over the mill at the time was astonished at the ease with which the mill was able to restart immediately the power was restored.

The arrangement of the three main rollermill drive motors is interesting. Each motor is mounted at an angle on a sliding block, and the slack on the ropes is taken up simply by loosening the motors on their guide rails. It is significant to note that with this arrangement, now that all the roller mills are equipped with roller bearings, it is possible to bar over all rollermills from the motor by simply pulling on the belt with one hand.

Purifiers, bran finishers and several other machines are driven by individual motors, with stop and start arrangements in the motor room. All the motors are integrated through a sequence interlocking system.

Mixing-in arrangements are provided at various points by Velofeeders, and alarm and warning signals are also incorporated in the plant.

The mill has achieved and maintained over a long period the standard of extraction and capacity expected of it, and this is a tribute to the way in which the local staff have adapted themselves to the application of the equipment that has been installed.

Clifford E. Soward was appointed president of Maple Leaf in 1955; he is assisted by executive vice-president Graham MacLachlan and vice-president in charge of production John Elder. Stuart Butler, production superintendent, and Jack Lynde, chief engineer, worked out with Simon technicians the technical details of providing the flexibility for all the products required.

—BREAD IS THE STAFF OF LIFE—

### *Races of Rust*

WINNIPEG — Stem rust of wheat, the most dangerous disease of that crop is made up of many different strains that look alike but differ in their disease-producing abilities. These strains are the so-called physiologic races. One of the functions of the Plant Pathology Laboratory in Winnipeg is to carry out annually the physiologic-race survey for stem rust of wheat.

The task of producing stem-rust resistant wheat varieties requires the production of varieties resistant to all the physiologic races current in the Mississippi Valley. This was accomplished in the mid-thirties by the production of varieties such as Thatcher, Renown, Rival, and others.

One might well ask: Why worry about these races once varieties have been produced that are resistant to them? The answer is that new races of the rust are found every year, for example approximately 15 or 20 races are found each year in the prairie provinces. However, the 15 or 20 races found in 1950 were not the same as the 15 or 20 found in 1930. To remain resistant to rust, the wheat variety must be resistant to the new races as well as the old.

Most of the new races that come along are no more dangerous to rust resistant wheats than the older races. Now and then, however, a new race appears that is so different that it poses a threat to the resistant wheats. Race 15B, which broke out in 1950 was one such race. Unlike other races it could attack Thatcher and other resistant varieties.

The race surveys in the prairies are performed principally to discover new and dangerous races of rust as soon as possible. When such a race is discovered the scientist must develop something resistant to it as well as the other known races. Selkirk was the first successful answer to race 15B, but even before Selkirk was in the hands of the farmer another race had been found to which Selkirk was susceptible. This race was so similar to 15B that it had to be considered as a substrain.

One of the chief difficulties of carrying out a physiologic-race survey is that the new and dangerous races that happen along are usually substrains of races already known.

**PNEUMATIC PLANT—Important in the new Maple Leaf plant is the application of pneumatics. The first picture shows the pneumatic cyclones and rotary seals on the top floor. The operative is adjusting a sight glass under one of the pneumatic cyclones. The second picture shows the British-type bran finishers.**

## U. S. TIGHTENS MINIMUM SANITARY MILL LIMITS!

### New Levels Effective During 1956 Crop Year

### BASIS OF LEGAL ACTION 1% OF INSECT DAMAGE

**Only 1 Rodent Pellet per Pint Maximum Permitted**

The basis of legal action on filth-contaminated wheat will be lowered to the following:

1 or more rodent pellets per pint of wheat (liquid measure) or 1% or more of insect-damaged kernels.

The change will be put into effect July 1, 1956, to coincide with the beginning of the crop year, and thus permit time for the Grain Trade to make necessary adjustments.

These levels will be applied in random sampling of cars of wheat.

Excerpt from U.S. Health, Education and Welfare Food and Drug Administration Bulletin M2715

WASHINGTON, D. C.—The Food and Drug Administration has announced that it will tighten sanitary requirements on wheat beginning July, 1956, to promote increased cleanliness in the Nation's food supply.

George P. Larrick, Commissioner of Food & Drugs, stated that during the period January through July 31, 1955, wheat from 3,754 cars was examined. Of these, 29 cars were found to contain filth in excess of the rodent actionable level, and 3 cars showed insect damage to the extent of 2% or more of the kernels.

The Commissioner said: "Under the Program, substantial progress has been made in improving handling and storage of wheat to prevent contamination. However, experience acquired during the past six months shows that the levels of judgment should be tightened if the program is to continue to be effective."


THIS SEASON BE SURE WITH AEROSOL

Larvacide®

- EFFECTIVE on both insects and rodents
- FAST AIRING—no liquid touches the floor
- LOW COST, overnight fumigation
- SAFE TO USE. Non separable Tear-Gas Warning
- EASILY APPLIED, one application only

DO IT YOURSELF

Pipe your own Plant, in hours, easily and inexpensively with our new plastic Piping System

To help you surpass the requirements of the new regulations—write at once for free copy of the new guide to effective and safer mill fumigation and for literature on Aerosol Larvacide and the new piping system.

LP INC. Larvacide Products, Inc.

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Consequently they are difficult to distinguish from the original races.

At present there are several parasitic strains known that are potential threats to Selkirk wheat, though fortunately none of them are common at the present time. All these strains may be regarded as substrains of either race 15B or race 29.

Greyhound's frequent schedules get your shipments on the road quicker... to their destination sooner! Ask for complete information and rates from your nearby Greyhound agent.

- Valuable hours, even days, are often saved.
- Center-of-town to center-of-town service almost anywhere in the U.S.A.
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Same-day service to many destinations

GREYHOUND


## Kansas Report Predicts Higher Wheat Prices

MANHATTAN, KANSAS—Slightly higher wheat prices are expected in early May, but prices are expected to develop a downward trend in the latter part of the month, according to the Kansas Agricultural Situation, published by Kansas State College.

With the veto of the Agricultural Act of 1956, the President announced that price support on the 1956 wheat crop will be set at 84% of transitional parity which amounts to a national average support level of $2 bu. This compares with the minimum of $1.81 previously set for 1956 based on 76% of parity. The new rate is 8¢ below the 1955 national average level.

The official April winter wheat forecast of 716.5 million bushels is 11.1 million above the 1955 final production. Growing wheat in Kansas and Oklahoma is in fairly good condition, but rain is needed since subsoil moisture is still short.

Although the latest CCC figures indicate some possible tightness in free wheat supplies, this has not been reflected as yet in the cash wheat market, the report says.

With new crop prospects fairly good as compared to a year earlier, wheat prices are expected to adjust downward in May. Although substantial adjustment did not occur last year until late May and early June, the downward adjustment may be earlier than last year, if new crop prospects continue good. In addition, many flour buyers have been able to delay purchases because of a backlog of orders.

Mills are reported to be carrying good to ample stocks for their needs. This could result in downward pressure on prices if these conditions continue. The decline, however, may not be as sharp as a year earlier since the new support is only 8¢ under last year, whereas, the 1955 rate was 16¢ less than the 1954 national average rate.

The President, in vetoing the Agricultural Act of 1956, announced that 1956 corn supports will be increased from 81 to 86% of transitional parity. This will boost the national average support level from $1.40 to $1.50 bu.

—BREAD IS THE STAFF OF LIFE—

## Indian Milling Firm Completes Plant Remodel Program

BOMBAY—The newly-remodeled plant of Wallace Flour Mills Co., Ltd., Bombay, India, was recently started up. Designed by Thomas Robinson & Son, Ltd., Rochdale, England, the plant has a capacity of 670 sacks, basis 24 hours' operation. The plant has been incorporated into an existing building giving the firm a total capacity of 12,000 sacks.

Attending the opening was L. M. Robinson, a director of Robinsons, who has just concluded a lengthy tour of the Middle East and India where his company is engaged in a number of remodeling projects.


A. E. BAXTER ENGINEERING CO.

*Designers and Engineers for Mills, Elevators and Feed Mills*

900 ELECTRIC BUILDING BUFFALO 3, NEW YORK


## *U.S. Eases Curbs on Exports to Russia*

WASHINGTON — Recently the U.S. Department of Commerce modified its export restrictions on a long list of commodities and products which may be shipped to Russia or other Iron Curtain nations under general license provisions.

This relaxation means that it is no longer necessary for an exporter to apply for an export permit for such exports but may move them under what is known as a general license which an exporter may execute himself.

It is important to note that this relaxation does not include any products from U.S. Department of Agriculture surplus stocks and would not include any products receiving export subsidies.

—BREAD IS THE STAFF OF LIFE—

**All of us owe a debt of gratitude to John Montagu, a man torn between his loves for food and gambling. Hungry one day but unwilling to interrupt his game, he had a servant place a slice of meat between two slices of bread. Thus was born an invention that perpetuates the name of John Montagu, fourth Earl of Sandwich.**


NOW! Explosion-Free Housekeeping for ...MILLS and ELEVATORS

● Now you can not only speed up your housekeeping, but you can do it better and in complete safety with a MULTI-CLEAN H-500 Explosion-Proof Industrial Vacuum Cleaner.

Underwriters' Laboratories have approved the H-500 for Class I, Group D, and Class II, Group G locations. This means you can vacuum-clean without danger of fire or explosion in and around elevator boot pits, grain storage bins, milling machinery... in fact, in all locations in mills and elevators where the atmosphere contains explosive vapors or grain dust.

EXPLOSION-PROOF ATTACHMENTS are available for every cleaning job from floor to ceiling. The H-500 will cut all your cleaning costs to a minimum no matter how large or small your operation.

WHY THE H-500 IS EXPLOSION-PROOF

1. Totally enclosed motor, universal type, ⅞ hp, 115 V.
2. 40-ft., 14-gauge, 3-conductor cord of heavy-duty neoprene rubber.
3. Heavy-duty Crouse-Hinds explosion-proof switch.
4. Aluminum tank holds 10 gals. liquid, 1½ bu. dry material.
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6. Mounted on 4, ball-bearing, swivel type, explosion-proof casters fastened to band around tank.
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8. Curved aluminum wand.
9. Spark-resistant brushes of special fibre or bronze wire mix.
10. All other parts and accessories of spark-resistant brass or aluminum.

*Fill out and mail the coupon now for further information.*

MULTI-CLEAN Method

The combination of the right Multi-Clean Equipment and Materials with the correct procedure.

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2277 Ford Parkway, St. Paul 1, Minn.
Gentlemen: Send me complete information on the:
☐ Explosion-Proof Vacuum Cleaner
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## CYPAK

(Continued from page 15a)

A high grade ferromagnetic material, Hypernik V, which offers a square hysteresis loop forms the core of the high grade transformers used in CYPAK. A winding placed on such a core offers a very high impedance when the core flux density, B, is between Bm+ and Bm— and a very low impedance when an attempt is made to increase the flux density beyond these values. The output circuit of the CYPAK AND element consisting of an AC voltage source, a winding on a Hypernik V core, a rectifier, can be illustrated. The core may be shown in the form of the square hysteresis loop previously shown for convenience in referring to this loop. With the core at Bm— and the instantaneous polarity of terminal A positive, current flows through winding N and the rectifier and drives the core to the positive saturation point Bm+. On the next half cycle of voltage nothing happens since current flow in the reverse direction is blocked by the rectifier. On the next positive half cycle the circuit conducts, but the core is at positive saturation, the winding, N, presents a very low impedance, and Eg appears across the load resistor. The portion of the during which terminal A is positive is known as the "gating" half cycle.

The input circuit of the "and" element is very similar to the output circuit. Action in this circuit is essentially the same as that described above except that the voltage Er causes current flow in the circuit only on its negative half cycle, the cycle occurs just after voltage Eg has driven the core to positive saturation, and the winding is in such a direction that the core is driven back to negative saturation point, Bm—. The half cycle during which the core is being driven back to Bm— is known as the "resetting" half cycle.

The circuit now causes the core to be driven alternately from Bm— to B+ and then back to Bm—. The magnitude of Eg and Er is so selected that the core never goes beyond Bm— or Bm+, thus no output can ever be expected.

The addition of an input signal to this circuit is necessary to obtain the operation desired. For a moment we will assume that this input signal may be applied directly across Rr and will result in canceling Er. Thus the core reaches and remains at the Bm+ point and output occurs.

Unfortunately, the input circuit must present a low impedance to the reset voltage in order to reset the core completely while at the same time it must present a high empedance to the incoming signal to provide least loading of the preceding stage. This is accomplished by the circuit known as the high speed Ramey Magamp, after Dr. Ramey, its discoverer.

The addition of several input circuits to this basic circuit results in the "and" element! For if any one of the inputs is absent no output can occur, since a reset path for voltage Er is available. The "not" element is the basic Ramey Magamp with no reset voltage used, but with the input signal providing reset of the core. The OR element is nothing more than several rectifiers in parallel to prevent one signal feeding back to a second circuit.

The "memory" element is a combination of two "not" and two "or" circuits. If input 1 signal is applied "not" 1 element ceases to produce an output, but "not" 2 has no input and thus produces an output which is fed back through "or" 1 to "not" 1, thus continuously resetting "not" 1 even with input signal 1 removed. This condition remains stable until a signal input 2 is applied. This type of "memory" element is stable as long as power remains on, but possibly may change state if power is removed and then reapplied. A second "memory" element stable even during power interruption is available also.

The addition of a capacitor-resistor network as one of the inputs to the "memory" element offers a time delay before output is obtained. Since the power levels used are too low to operate a contactor or solenoid doubler Magamps capable of outputs of 50, 150 and 300 volt amperes are available.

—BREAD IS THE STAFF OF LIFE—

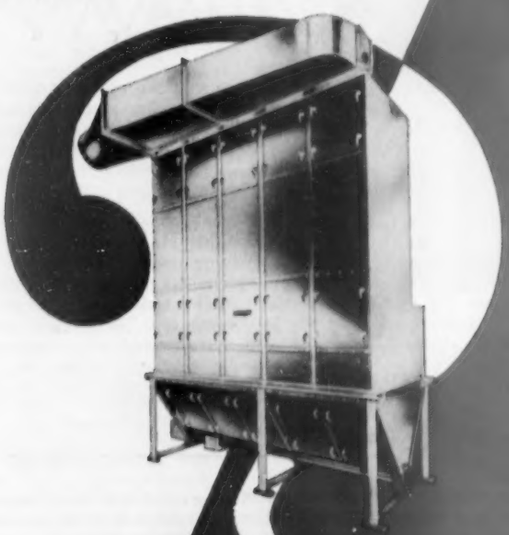
### MILLING OPERATION CLOSES

HENNESSY, OKLA. — The Star Mill & Elevator Co., in continuous operation in Hennessey, Okla., for 51 years, is closing down flour production. Company officials attributed reasons for the shutdown to unsatisfactory conditions in flour milling.


"DO-IT-YOURSELF" or "TURN-KEY" job???

an ENTOLETER DIVISION designed system solves dust collection problems either way . . .

Our engineering staff will specify the Simon Suction Filter Dust Collector to meet your mill requirements . . . ship you the parts and installation instructions and you can "DO-IT-YOURSELF"! All parts are jig-drilled and tapped to facilitate assembly . . . or dismantling should future requirements dictate its relocation.



OR. . .

Our engineering staff will design a "turn-key" dust collecting system incorporating a Simon Suction Filter Dust Collector, tailored to your specific requirements . . . contract and supervise its complete installation . . . relieving you of all details until it's time to pull the "ON" switch.

Regardless of which method solves your dust collecting problem . . . the SIMON SUCTION FILTER DUST COLLECTOR is the answer! It has been redesigned and streamlined to keep in step with modern milling practices . . . contains the greatest filtering area per square foot of floor space . . . operates with high air to cloth ratios . . . medium air flow . . . low power requirements . . . IT IS YOUR BEST BUY IN DUST COLLECTING EQUIPMENT!

ENTOLETER DIVISION
The Safety Car Heating & Lighting Company, Inc.
1187 Dixwell Ave., New Haven 4, Connecticut


## James Mills Named Head of Pioneer Section, AACC

WICHITA, KANSAS — James M. Mills, Kansas Milling Co., Wichita, was elected chairman of the Pioneer Section of American Association of Cereal Chemists at a meeting held at the Allis Hotel here on April 20-21. Forty members attended the sessions.

Other officers elected include: Vice chairman, Lyle P. Carmony, Sterwin Chemicals, Inc., Kansas City; and secretary-treasurer, Claude Neill, Enid (Okla.) Board of Trade Laboratory.

The group voted to continue the crop reporting committee with Ralph Potts, Wichita (Kansas) Flour Mills Co., as chairman.

Galen White, U.S. Department of Agriculture, Manhattan, Kansas, discussed the flotation method of determining hidden insect infestation. Another speaker, H. H. Laude, agronomist, Kansas State College, informed the members that all of Kansas, except the extreme western part, has prospects for a good wheat crop this year.

At the close of the meeting, the Pioneer check sample trophy awards were presented by the committee chairman, George Schiller, Pillsbury Mills, Inc., Enid, Okla., to the following for exceptional analytical work:

Moisture, H. H. Johnson, Gooch Mill & Elevator Co., Lincoln, Neb.; ash, Homer Poe, Union Equity Co-op. Exchange, Enid, Okla.; protein, Gerald Miller, department of milling industry, Kansas State College, Manhattan, and maltose, Wayne V. Parker, General Mills, Inc., Wichita.

The trophies were provided by Wallace & Tiernan, Inc., Sterwin Chemicals, Inc., Research Products Co. and the Kansas Milling Co.

The next meeting will be in August at the Hotel Youngblood, Enid, Okla., announced Claude Neill, secretary-treasurer of the group.

—BREAD IS THE STAFF OF LIFE—

## St. Louis Milling Club Enjoys Golf Outing

ST. LOUIS—The St. Louis Milling & Grain Club inaugurated its 1956 season with a golf outing and dinner at Crystal Lake Country Club on April 24. There was a turnout of 135 members and guests.

The golf tournament was the principal attraction during the afternoon. Frank B. Waddock, J. F. Imbs Milling Co., president of the club, presided at the dinner.

Members paid tribute to two members who died. They are Clark Waters, Sparks-Waters-Farnen, Inc., St. Louis, and A. C. Koch, Breese (Ill.) Grain Co.

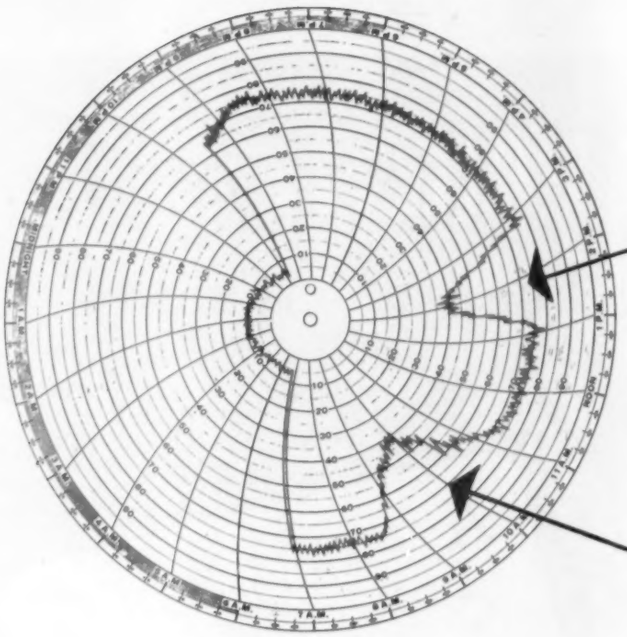
Eleven new members were approved, bringing membership to 209.

Mr. Waddock announced that the next meeting will be held early in June at Barth's Estate, the date to be announced later.

—BREAD IS THE STAFF OF LIFE—

### FIRE DESTROYS ELEVATOR

OKEENE, OKLA.—A wheat elevator and warehouse owned by the Farmers Cooperative Elevator here was destroyed by fire recently with a loss estimated at $100,000. Escaping losses were another elevator to the north and the Okeene Milling Co. plant to the south of the burned property.



# these mean trouble...

IT MIGHT BE a broken belt, a torn sieve, or a choke-up somewhere in the spouting.

But... no matter *what* causes the flow variation in the flour stream ... it's spotted the INSTANT it happens. One look at the graphic recorder operated from the W&T Massometer or Merchen Scale Meter tells the story. Even the smallest momentary fluctuations in flow rate are detected immediately and recorded accurately by these mill "watch dogs."

W&T Massometers and Merchen Scale Meters provide a continuous record – *by weight* – of actual mill performance. They tell you the *exact* flow rate of your streams and they pinpoint time and production losses.

Guaranteed to 1% accuracy, the Massometer will handle flour flows up to 200 pounds per minute... the Merchen Scale Meter, up to 600 pounds per minute. For other applications the Meter will handle flows up to 3000 pounds per minute. Both instruments have been tested and proved highly dependable in hundreds of installations throughout the country.

For complete information, write us today or communicate with your nearest W&T representative.

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M-19

# THE PERFECT PAIR...for the first two steps at head of cleaning

**The Carter Scalperator** is used to rough scalp and aspirate grain as it is unloaded for storage, and to aerate and turn stored grain. Designed to handle all types of grain, the Scalperator is made in several sizes, with maximum capacities ranging from 1,000 to 6,000 bushels per hour.

**The Carter Millerator** is used extensively for refined screening and aspirating at head of mill cleaning streams. It also is being used increasingly as a final cleaning operation to remove insect and rodent contamination from wheat, corn and other grains. Other applications include cleaning soybeans and removing hulls from cracked beans.

## HART-CARTER COMPANY

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ENGINEERS AND MANUFACTURERS OF GRAIN CLEANING MACHINERY